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SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



NOVEMBER 7, 1931

World's Longest Suspension Span

See Page 291

SCIENCE NEWS LETTER

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DO YOU KNOW THAT

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India has no native language common to all its peoples.

The United States consumes less than half of its great cotton crop.

A rubber paint is being tested by treating the fronts of government office buildings in Singapore with it.

New York City's first double-deck passenger elevators are to be placed in operation during the coming winter.

A new scientific laboratory has been opened at the Louvre in Paris for the study of paintings.

Bones of the pygmy hippopotamus and small elephant, found in caves on the Island of Cyprus, are evidence that in geological times Cyprus was linked with the mainland.

A life line for mine rescue work has been constructed which is equipped with an electrical signaling device and also supplies each member of the crew with light in addition to their cap lamps.

Approximately one million children in the United States have tuberculosis.

Excavation of gravel pits near Glasgow has yielded stone tools used by men of the very early Old Stone Age.

Tarnish on tin cooking vessels makes them more efficient by holding, rather than reflecting, heat.

A flood in a deforested canyon in California carried from 20 to 40 times as much sediment as the corresponding freshet in an adjoining forested canyon.

Laboratories and scientific institutes for film researches have been erected on the Krestowsky Isle, in Leningrad, Russia, for the study of the newest technical inventions that can be applied to cultural and educational films.

The U. S. Forest Products Laboratory says that the service life of paints is shortened materially by waiting too long between coats, and that the old idea of painting a house with a first coat in the fall and the next coat the following spring is not efficient.

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Science Service presents over the radio, an address

OUR PATENT SYSTEM

By Dr. Edwin Jay Prindle, Chairman of the Patents Committee, American Engineering Council

Friday, November 13, at 3:45 P. M., Eastern Standard Time

Over Stations of

The Columbia Broadcasting System

ENGINEERING

Hudson River Bridge Rivalled For Fame by New Arches

As Hudson Structure is Greatest Suspension Span, So Kill Van Kull and Sydney Bridges Exceed Other Arches

WHILE the completion of the great George Washington suspension bridge, which has hurled itself in one bold leap across 3,500 feet of the Hudson river from Manhattan to the New Jersey shore, is being celebrated, two other bridges, likewise the largest in the world of their kind, are being given finishing touches preparatory to their christening in the mighty stream of modern traffic.

They are twin bridges, or nearly so, for one is only two feet and one inch longer than the other; and they are built after exactly the same type of construction. They are steel arch structures that exceed their greatest predecessors even as the bridge across the Hudson surpasses the next mightiest suspension span.

These two structures are the Kill Van Kull steel arch bridge connecting Staten Island, a borough of New York City, with the mainland of New Jersey; and the Sydney harbor bridge in distant Australia.

Almost Twice as Long

The George Washington bridge has a span not quite twice as long as that of its nearest rival, the Detroit-Windsor Ambassador bridge, which was dedicated scarcely two years ago. The two new steel arch structures likewise leap far greater distances than those covered by the famous Hell Gate bridge in New York, which has maintained its lead since it was opened in 1917. The length of span between centers of end pins of the Kill Van Kull bridge is 1,652 feet and one inch, of the Sydney harbor bridge 1,650 feet, and of the Hell Gate bridge only 977 feet and six inches.

While a steel arch may lack the delicate swinging lines of suspended cables and may not cover the superlative distances necessary to excite popular imagination, its curve must be mathematically true so that its load will not put a few girders under dangerous stress and it must be erected with the linear accuracy of one part in thousands, if millions of dollars spent for materials and the work

of technical brains for years are not to be wasted.

Inaccuracy was not a fault of either of the twin bridges. The most dramatic moment during their construction proved that. This incident was the pinning together at the keystone of the arch of the two arms which had been erected out and up into space until they met more than 300 feet above the water and over 800 feet from land.

The engineers' aim at the center of the arch was accurate to one-half an inch for the Kill Van Kull bridge and to about one inch for the Sydney structure. And this was close enough. A few minor adjustments of temporary cables and jacks supporting the arms of the arch made the fit exact.

Although statistics on the American arch, which is slightly the larger of the two, are not as imposing as those for the George Washington bridge across the Hudson; they do describe a much-needed link in New York's transportation scheme, for the Kill Van Kull bridge is the final link in joining by highway New York's most populous borough, bustling Manhattan, with the least populous—spacious, residential Staten Island.

The bridge is being finished at a cost of about \$16,000,000 with a four-lane

vehicular roadway 40 feet wide between curbs and with one footpath. Later the roadway can be widened to accommodate three more lanes of traffic or two rapid transit tracks. The arch has a rise of 274 feet from the center line of the bearings to the center of the lower chord. Under the middle of the bridge there is a clearance of 150 feet above mean high water, while for a distance of 1,000 feet across the channel, the clearance is 135 feet.

To this structure the Australian bridge has the likeness of an identical twin with the exception of a slight inclination to be short and stout. In addition to its two-foot one-inch difference in length, the bridge provides a wider roadway than (Please turn page)

ASTRONOMY

Nagata Rewarded For Discovery of Comet

MASANI NAGATA, melon-patch worker and amateur astronomer, has been rewarded for discovering a comet which caused his name to be spoken throughout the scientific world. The Japanese melon-farm foreman has been awarded the Donohoe comet medal by the Astronomical Society of the Pacific for his discovery last July, Alfred H. Joy, president, has announced.

The unexpected discovery was observed on the night of July 16. Nagata was making his customary observations with a three-inch telescope when the comet crossed his line of vision. Confirmation was sought and received from the Mt. Wilson Observatory. This showed that Nagata had observed the first new comet of 1931.

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AIMED AT THE "KEYSTONE"

That is what might have been said of the Sydney Harbor arch bridge at this period of its construction when its two halves were leaning precariously out into space, feeling for each other. The twin to the Sydney structure is the Kill Van Kull bridge, near New York City.

its American twin. The deck has a clearance of 170 feet above high water.

The cost, however, is expected to exceed 6,000,000 pounds, a much greater sum than that needed for the American twin. This greater financial outlay may be partly explained by the fact that most of the steel work, under a stipulation of the government of New South Wales, had to be manufactured at the site,

while America's bridge was built very close to steel manufacturing centers. Huge workshops were erected near the Sydney structure to fabricate its steel.

Stone used in facing the abutments to the bridge was quarried 200 miles south of Sydney and brought to the bridge site in three 400-ton ships built especially for the purpose.

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ARCHAEOLOGY

Discovery Shows Early Greek City One of "Better Homes"

THE BELIEF that Greeks, before their great Hellenistic age, built fine temples for their gods but lodged themselves in small, mean houses "like wasps' nests" must be revised, declares Dr. David M. Robinson, professor of archaeology at the Johns Hopkins University. Dr. Robinson, who has returned from excavating at the ruins of Olynthus, in Macedonia, has found there new facts about city life in ancient Greece.

Digging into the streets of Olynthus, Dr. Robinson has found large houses, designed with taste and with an eye to comfort. These homes date from the fifth and fourth centuries B. C. In 348 B. C. Olynthus was destroyed by Philip of Macedon, father of Alexander.

Until now, archaeologists have excavated no city of this period of Greek history. Hence Dr. Robinson's expeditions to Olynthus are filling in many gaps in knowledge of Greek city life.

A Greek Residence

A house in Olynthus which Dr. Robinson calls typical has been given the name House of the Comedian. One doorway from the court opens into a living room with a beautiful pebble mosaic floor in a wheel design. Around the edge of the room is a raised border three feet wide. This wide ledge was a peculiar feature of Olynthian houses. The ledge would have been a convenient foundation for couches, either in sleeping rooms or dining halls, Dr. Robinson explains. Walls of the living room in the House of the Comedian were painted in simple designs. In the floor may be seen the narrow ditch for draining off water when the mosaic floor was scrubbed.

Dr. Robinson found in this house the oldest true mosaic-paved peristyle, or

inner court surrounded by columns or pillars, that has yet been discovered in a Greek home. The court in the peristyle is paved with a mosaic floor depicting lions, wild boars, ducks, a centaur, men hunting boars and deer and griffins attacking a deer. The design is worked out in pebbles of black and white, purple and green.

On the north side of the court three rooms were placed to face the south and get the sun. This was another architectural feature common in Olynthus, and a very practical one, Dr. Robinson shows. Letting in sunlight was necessary in houses heated only by charcoal stoves and braziers.

If the House of the Comedian had only a rudimentary heating system, supplemented by heat from the sky, at least it had good plumbing. There was a shower bath, so arranged that water could be poured over the bather and drained off. There was also a terra cotta bath tub. Olynthian bath tubs were no full-length affairs, but were more of an arm-chair type.

An unusual architectural feature of the house was a bay window or balcony, ruins of which may still be seen on the first floor. Finding this was a surprise to Dr. Robinson, who points out that balconies were well known in Pompeii, much later, but none have been found heretofore in houses of early classical times.

No metal furniture could be found in the House of the Comedian or any other dwelling in Olynthus. Probably the couches and tables were of wood, long since decayed. An idea of how the homes were furnished may be had from the small articles taken from the buried ruins. In the House of the Comedian have been found 46 vases, 26 terra



AN ACTOR FIGURINE

Of the fourth century B. C. of the Greek city Olynthus. This terra cotta statuette inspired the name "House of the Comedian."

cotta figurines, 98 loom weights, seven lamps and a beautiful bronze ring ornamented with figures representing comedy and tragedy.

From this ring and from the figurine of a Greek actor, Dr. Robinson bestowed upon the house its new archaeological name, the House of the Comedian. Perhaps a patron of the theater lived there, says the archaeologist. He may also have won in a chariot race, as one of the large Attic vases found in this house, a crater, depicts Victory crowning a four-horse chariot, with another Victory in the chariot box, along with a warrior armed with a shield on which is a Gorgon's head. On the other side Victories are erecting trophies as on the frieze of the Nike temple from the Athenian Acropolis. The big vase also shows the influence of the Parthenon frieze and was probably given as a prize to the winner.

Olynthus shows the modern world for the first time what Greek city planning was like in the centuries when Hellenic civilization was on the rise. The streets of the city were neatly laid out in right angles. There were 10 houses to a block, five on each side with a narrow alley running between.

It appears that a Greek city of 50,000 people in the early fourth century B. C. was a community of "better homes" and some of them fine residences.

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PHYSICS

New Device Lessens Danger From Treatment with X-Rays

Apparatus Developed at Bureau of Standards Enables First Uniform Measurement of Roentgen-Ray Intensity

THE DANGER of burns during X-ray treatments has been greatly lessened according to Dr. Lauriston Taylor of the U. S. Bureau of Standards, by the completion and final testing of apparatus designed to measure the intensity of X-ray doses.

"Until now, no exact and uniform measurement of the strength of X-rays has been possible," it is explained by Dr. Taylor, who has just returned from Europe with the primary X-ray standard which he designed for the United States. "Now a doctor may calibrate his apparatus to learn the intensity of his X-ray doses without the necessity of guesswork. He will not burn his patient, nor will he commit the worse crime, in cases such as cancer, of undertreating him."

Experimented Abroad

According to Dr. Taylor, there are two factors in X-ray treatment, the intensity and the penetrative power of the rays. The rays' penetrative power depends on the shortness of its wavelength, longer waves having a burning effect. The intensity of the X-ray dose is more important, and it is this intensity which he can now measure.

For three months Dr. Taylor experimented in European national standardizing laboratories, consulting foreign scientists and comparing his apparatus with theirs. Before that he labored at his instruments in the Bureau of Standards in Washington, D. C., to construct a portable X-ray standard, finally building one which is so simple that he could take it with him, and so accurate and dependable that it is designated as the primary or final standard of the United States. This he compared with foreign instruments, drawing up with European scientists specifications for an international standard to remedy international confusion. This new apparatus is the only one in the world that completely satisfies these specifications, Dr. Taylor says.

Uncle Sam's X-ray yardstick is in reality a small metal chamber into which

X-rays are projected in a steady, uniform beam. When the rays pass through the air in this chamber they ionize the air, that is, set loose free electrons. This causes the air to become a partial conductor of electricity, which may be measured by an electric current and meters. The strength of this current depends on the strength of the X-rays.

France, Dr. Taylor said, had been comparing X-rays with radium emission, but the X-ray intensity as thus measured varied with the ray's wavelength. The English laboratories did not guarantee steady and uniform transmission of the ray being gauged. The American apparatus does away with both difficulties, and furnishes as nearly as possible a means for transmitting, maintaining and measuring a ray of uniform and standard intensity independent of all other conditions. For this reason France, Egypt, and several other countries have adopted Dr. Taylor's specifications outright, and other countries have drawn

up specifications which at present his apparatus alone fits.

"It is now up to the Bureau," Dr. Taylor said, "to find a means for gauging exactly the penetrative qualities of the various X-ray wavelengths. The intensity of a ray used in medical treatment is but half the problem. Not until we have both standards can we call our standardization work complete."

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RADIO

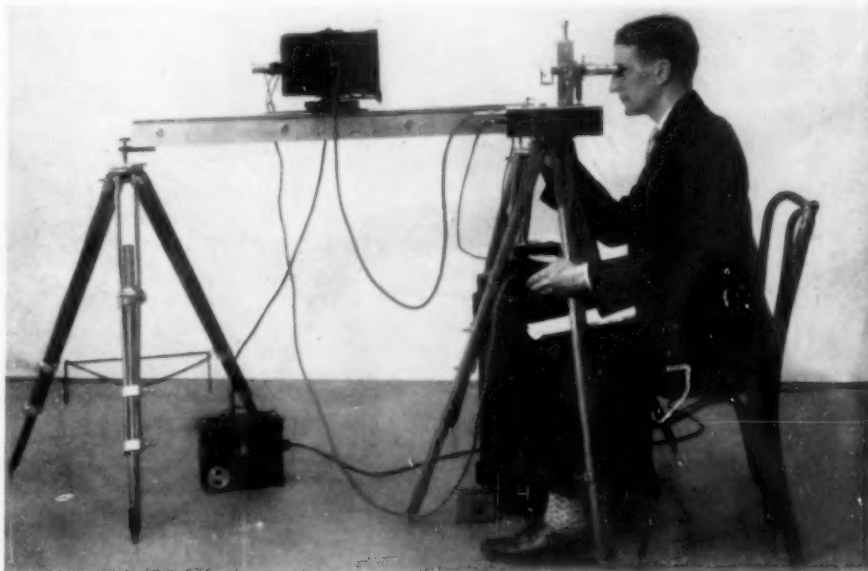
Radio Reception Improves As Sun Spots Decrease

RADIO RECEPTION is getting better, and it will continue to improve during winter months, attaining conditions which have not been duplicated since the great improvement in radio receivers and the advent of the high-powered transmitting stations of recent years.

This is the observation and prediction of Dr. Harlan T. Stetson, director of Perkins Observatory of Ohio Wesleyan University, who has made careful studies of the relation between sunspots and radio reception.

Dr. Stetson says that during the past six months, from March to September, radio reception improved 400 per cent. During the same period sunspot activity became less, the sunspot index for September being only half its March value.

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MEASURING X-RAY INTENSITY

One of the newest of the primary standards of the United States, an apparatus for measuring X-ray intensity. Its "birth" was celebrated by a tour of Europe with Dr. Taylor of the Bureau of Standards, for comparison with foreign apparatus in an attempt to make uniform the delicate measurements necessary in cancer treatments.

ASTRONOMY

Foretasting Meteors

Shooting Stars Seen on November Nights Will Indicate Display to be Expected During the Next Two Years

By JAMES STOKLEY

AFTER being bitterly disappointed a third of a century ago, astronomers are hoping that the next few years will bring another brilliant display of the Leonid meteors, or "shooting stars." This month should be a good foretaste of what is to come in 1932 and 1933. On the nights of November 14 to 17, with the assistance of thousands of volunteer amateur observers, they will watch the heavens for meteors. Should there be a good display, that is, should they be seen at the rate of several hundred an hour, it may be indicative of an even finer display next year or so. But if the nights of the fourteenth to seventeenth are only sparingly productive of meteors, it may mean that once again the Leonid meteors have been side-tracked.

It was in the year 1799 that the modern history of the Leonids began, though there are records of numerous shooting stars about the middle of November dating back many centuries before that. In November, 1799, according to one contemporary account, "the whole heavens appeared as if illuminated by sky-rockets, which disappeared only by the light of the sun after daybreak. The meteors . . . appeared at any one instant as numerous as the stars."

In 1833, the display was repeated, on the night of November 12. Prof. Denison Olmsted, of Yale, thus described it: "To form some idea of the phenomenon, the reader may imagine a constant succession of fireballs, resembling rockets, radiating in all directions from a point in the heavens. . . . They commenced their progress at different distances from the radiating point, but the lines they described, if produced upwards, would all have met in the same part of the heavens." This curious fact, that the meteors all seem to radiate from a certain point in the sky, was independently noticed by other observers, and is now recognized as characteristic of meteor showers.

Again, in 1866, there was a brilliant shower seen, though not as fine as the two previous ones. H. A. Newton, of

Yale, had predicted the return of the shower that year, and it afforded a splendid confirmation of his forecast. After this, there seemed little doubt that 1899 would bring another fine shower, and one was expected by astronomers and public alike. But during the crucial nights, only a few scattered meteors were observed, to the disappointment of everyone. As a result, astronomers are very hesitant about predicting another shower in 1932 or 1933, but they are in hopes. At least, they have found out why the meteors did not return in 1899.

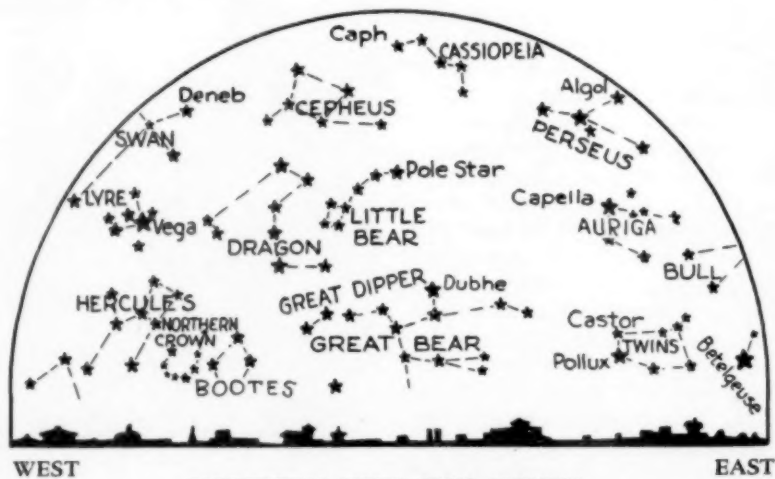
Moving in Ring

The meteors are moving around the sun in a gigantic ring, partly pulled out in one direction to form an ellipse 1,900,000,000 miles long—about 21 times the distance between the earth and the sun. There are meteors all around this ring, but they are not uniformly scattered. At one place they are particularly concentrated. All of the meteors in the swarm are moving at a speed sufficient to take them completely around the sun in $33\frac{1}{4}$ years. At one point, this ring crosses the orbit of the earth, and this is the place that the earth occupies in November. Thus every year when we cross the stream some of the meteors enter the earth's atmosphere,

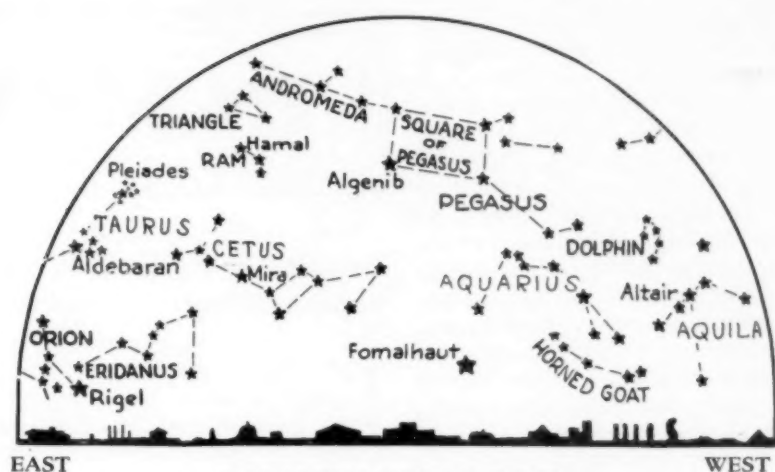
where they are completely burned by the friction with the air, causing the "shooting stars". And when we hit the concentrated part of the stream, the meteors are so numerous as to cause a display like that of 1799, 1833 and 1866. When they reach the earth they are moving in parallel paths, and the vanishing point of their paths in the distance causes the effect noticed by Olmsted, that they seem to radiate from one part of the sky. This radiant is in the constellation of Leo, the lion, and thus they are called the Leonid meteors.

From this it would seem as if there were no reason why the meteors should not come every 33 years, with just as much certainty as an eclipse of the sun. But the earth is not the only planet that they approach. At one part of their path, they also cross the orbit of Jupiter, largest of all the planets. The main swarm of Leonids takes about three years to pass a single point. Before it had reached the earth in 1899 it had passed close to Jupiter, and by his great gravitational attraction, he had pulled it aside, or perturbed it. This happened as the center of the group passed Jupiter, the head and the tail having passed on with little perturbation. The result was that in 1898 and 1901 moderately large numbers of meteors were seen, but in 1899 and 1900, when the heart of the swarm went by, it missed the earth completely.

What Jupiter may have done since then nobody knows. Possibly the me-



Here is visible Auriga the charioteer, in which group the brilliant Capella shines. Cygnus, or the northern cross, and Vega, marking the Lyra constellation, are also prominent. The Great and Little Bears occupy the center of the picture.



THE APPEARANCE OF ORION

Over the southeastern horizon signals the coming of winter. Just at this time the mighty warrior holds an undignified pose. The three stars that mark his belt are upright, while he is preparing to strike the bull, represented by Taurus, above him.

teors may have been switched still farther aside, or possibly they may have been switched back again. In any event, last November did bring a better display of meteors than any time since 1901, a fact which indicates that the head of the main swarm was at least aimed the right way. But 1898 brought a more brilliant shower than for many years previously, so the astronomers are rightly cautious about putting too much faith in last year's display as a forecast of an even finer one this year.

Crucial Nights

In any event, it is important that the sky be watched on the critical nights. November 14 and 15 is usually regarded as the time of the maximum, but last year the good display was seen, where clouds did not interfere, on the night of the sixteenth. Because of the way the earth is turning, we meet meteors head-on after midnight, while those that we see before midnight are only the ones that can catch up to us. Therefore, the early morning hours are always the best, and it is the mornings of November 15, 16 and 17 on which the sky should be carefully scanned. After midnight, at that time, Leo shines in the eastern sky, and it can be recognized from the familiar sickle, with the star Regulus at the end of the handle. The point of the sickle is directed upwards and to the left. The moon, at first quarter on the sixteenth, will have set about midnight, so the night will be dark.

The most important fact that the astronomers want to know is how many meteors occur, and during what hours. So if you want to aid in this work, all

you need to do is to watch the sky, and count the number of meteors seen during half-hour periods, say from midnight to 12:30, from 12:30 to 1:00, from 1:00 to 1:30 and so on. With several people cooperating, each can look in one direction, and the whole sky can be covered. If one person is working alone he should watch the eastern sky. With the aid of a flashlight, notes on all meteors seen should be made immediately, as well as any passing clouds that may interfere. If any meteor appears particularly bright, or leaves a glowing train after it, this also should be noted. The times of all occurrences should be set down accurately. After the night is over, and you have these records, send them to Prof. Charles P. Oliver, at the University of Pennsylvania, Philadelphia, who is one of the world's leading meteor authorities, and who welcomes amateur assistance in his work. Perhaps one part of the country may be cloudy, so the more people there are out observing, and the more widely are they scattered, the better the chances for securing the information wanted.

The origin of meteors is a question that has not yet been finally answered, but it appears certain that they are the remains of comets, in many cases at least. The Leonid meteor swarm follows almost exactly the same path as Tempel's comet, which was discovered in 1866. Probably the comets, and the meteors as well, are the debris of the evolution of the solar system, which almost certainly occurred when a passing star pulled from the sun the matter which since formed the planets. The connection between meteors and comets

is even more clearly shown by a shower that occurs a little later in November, but which now seems pretty well exhausted. This shower is called the Andromedes, because it radiates from the constellation of Andromeda, and it appeared right after Biela's comet, first discovered in 1826, had disappeared, and in the place where the comet was expected. It is between November 17 and 27 that the Andromedes can now be seen.

Brilliant Aldebaran

Aside from the meteors, nothing extraordinary is scheduled for November in the heavens. As always, in this month, the stars show the coming of winter, when Orion appears over the eastern horizon. Now the giant warrior is on his way back in a very undignified posture. The three stars that mark his belt are upright. To their right is Rigel, and to the left Betelgeuse, both first magnitude stars. Directly above Orion can be seen the stars of Taurus, which are supposed to represent a bull, which Orion is about to strike with his upraised club. The most brilliant star in Taurus is the red Aldebaran, which marks the bull's eye. Adjoining Taurus, to the north, is the group of Auriga, the charioteer, in which shines the brilliant Capella. In the western sky is Cygnus, the swan, also called the northern cross, now upright, with Deneb at the top. Below it and to the right is Vega, which marks Lyra, the lyre; and to the left is the star Altair, in Aquila, the eagle. Low in the southwest is a bright star, Fomalhaut, which is in the constellation of Piscis Austrinus, the southern fish.

A characteristic star group of late autumn evenings is the "Great Square in Pegasus," high in the south. Actually only three of the stars in the square are in the constellation of Pegasus, the winged horse. The northeasternmost one is called Alpheratz; it is in the neighboring constellation of Andromeda. To the north of Andromeda is Cassiopeia, who according to mythology was her mother. Perseus, the hero who rescued her from death, is represented by the star group to the east.

The moon, during November, is at last quarter on the third, new on the ninth, at first quarter on 16th and full on the 25th. Thus there will be bright moonlight evenings from about the thirteenth to the twenty-seventh.

Several planets can be seen during the evening, or at least before midnight, but none is (Please turn to page 303)

VITAL STATISTICS

Chances to Have Large Family are Very Slim

THE PROBABILITY that a boy born in the United States today will grow up to have a very large family is very slight indeed, it is indicated by a table of chances included in a report by Dr. Alfred J. Lotka, a life insurance statistician of New York City, to the Washington Academy of Sciences.

The newborn boy has only one chance out of 10,000 of eventually marrying and having 18 children. He has less than 972 chances out of 10,000, not quite one out of ten, to have a family of just three children. But there are 3,686 chances out of 10,000 that he will have no children at all.

The chances of having a son to carry on the family name are, of course, even slimmer. The chances for the population in general are 4,981 out of 10,000 that no son will ever be born to today's newborn boy. They are 2,103 that he will have just one son, 1,270 that he will have just two sons, and they gradually dwindle until they number only 5 out of 10,000 that he will have ten sons.

In a particular family, Dr. Lotka points out, the chances for sons may be greater or less, because of the fact that there is a marked tendency, due undoubtedly to physiological causes, for some families to have a considerably larger proportion of one sex, either boys or girls.

For the general population, however, the chances are nearly nine out of ten that the male succession and hence the family name for that particular branch will die out.

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GENERAL SCIENCE

Wells Sees Economics As Branch of Biology

"ECONOMICS is a branch of ecology."

With this definition, H. G. Wells, literary campaigner for more organized knowledge diffused more widely, put biological science in a position basic to the science of ordered civilization.

Ecology, Mr. Wells explained to questioning reporters in an interview at Washington, is concerned with the relationship of the living being to its environment. It is an area within the broad field of biology. And Mr. Wells views

economics and sociology, potential saviors of a faltering civilization, as based on biology.

Asked whether our present civilization contains within itself the means to cure its economic ills, Mr. Wells said that the popular notion that economists always contradict each other is not true. The growing body of economic and political science is not so operative in present day life as physics and biology, but, in Mr. Wells' opinion, it must become more effective.

If it is desired to build a new electric power plant, Mr. Wells explained by analogy, it is not planned by taking a popular vote but instead experts are called in. He foresees that our social structure will become more and more planned by economic and sociological experts.

Science News Letter, November 7, 1931

GEOLOGY

Earthquakes Responsible For Undersea Canyon

EARTHQUAKES brought into existence the canyon under the Mediterranean Sea, or, in the language of the geologist, the "submarine trough," recently discovered off the east shore of Cyprus. This is the view expressed by Prof. J. W. Gregory, noted British geologist, in a report to the *Geographical Journal*.

The trough was discovered when officers of H. M. S. *Ormonde* were making a survey of waters east of Cyprus. The trough is half a mile long, quarter of a mile wide, with flat, slanting floor and remarkably steep walls. The floor of the chasm is between 700 and 980 feet below the surface of the sea.

The hydrographer is quoted as saying, "I do not recollect having seen on a chart such an abrupt and deep cleft like this."

"As the trough is opposite the ruins of Salamis," writes Prof. Gregory, "the first suggestion was naturally that it might have been made by the earthquakes which overthrew that city."

Taking into consideration the geological features of the Island of Cyprus, Prof. Gregory finds two possible ways in which the trough might have come into existence. One is by excavation wrought by river or sea. The other is by foundering of the sea floor in some geologic convulsion. The latter is more plausible, the British geologist considers. Cyprus has had earthquakes both in ancient and modern time.

Science News Letter, November 7, 1931

IN SCIENCE

MEDICINE

Rat-Bite Fever Germ Reported from Manila

THE CASE of a native child who developed rat-bite fever after being bitten by a rat has been reported by Ana Vazquez-Colet of the Bureau of Science at Manila to the *Philippine Journal of Science*.

The disease has been known for a long time in China and Japan and a few cases have been reported in the Philippines, but this is the first time that the organism causing it, *Spirocheta morsus muris*, has been found in a case at Manila.

The patient, a girl four years old, was bitten on the forehead by a rat while in bed. The bite healed, but a week later she developed fever and the skin around the healed bite became swollen and red. The fever came and went, with periods of about two days in between when there was no fever. She was brought to the Bureau of Science for Pasteur treatment. A few drops of blood and some bits of tissue were obtained from the forehead near the bite. The organism causing the disease was discovered in examination of these specimens. The child recovered after about six weeks.

Science News Letter, November 7, 1931

CHEMISTRY

Potatoes That Blacken Detected by New Test

IF YOU HAVE a lot of potatoes that turn black when they are cooked, you can at least partly overcome this troublesome tendency by putting a little vinegar in the water while they are being boiled.

This practical household hint is a by-product of an investigation by Dr. C. K. Tinkler of King's College for Household and Social Science at London. His primary objective was to work out a simple chemical test which would enable large-scale handlers of potatoes to detect such tubers as possess this value-damaging defect.

Science News Letter, November 7, 1931

ANCE FIELDS

ENGINEERING

Floodlights to Illuminate Washington Monument

SOON the Washington Monument, 555-foot marble obelisk, will never be left in darkness.

To eliminate the hazards the monument presents to aviators, twenty new floodlights will be switched on about November 15, completely illuminating it for the first time. But all twenty will be regularly used only on foggy nights. Tests showed too much light gave the monument a rounded appearance, thus reducing its visibility.

Engineers, in considering illumination schemes, at first doubted the effectiveness of floodlights. They favored searchlights, located several hundred feet from the monument.

Experiments with both types showed the searchlights to be unsuited. Instead of concentrating on the monument itself, their beams extended across the road about the monument grounds. Now floodlights, in groups of five, will be placed forty feet from each side of the monument.

For years the only means of illuminating the tapering shaft, searchlights will still help drive away the darkness. The shape of Washington Monument is such that floodlights cannot reach the top, which veers off sharply to a point. Hence two searchlights located on nearby buildings will serve to keep the monument's peak clearly visible.

Science News Letter, November 7, 1931

ARCHAEOLOGY

Pueblo Battle Trophies Concealed Underground

CONCEALED in underground chambers in Pueblo villages are battle trophies which Pueblo warriors took from the Spanish conquerors in hard fought battles four hundred years ago. These old leather shields and spear heads, swords and halberds, have been seen by only a few white men, scientists engaged in research work. Some of these visitors have been allowed to look, but not touch, when they were

brought to the hiding places of the trophies.

"Certain of these old Spanish arms are at the present time in underground chambers in the old, nearly deserted village of Oraibi," reports Arthur Woodward, of the Los Angeles Museum, who has been visiting the Pueblos. "Some of the weapons have been given to 'the Old People' who are the spirits of the departed Hopi Indians. The Spanish arms have been given them along with old masks, old pottery vessels and other bits of sacred paraphernalia, to be used by them when they return at intervals from the Underworld to hold ghostly dances in the old plaza at Oraibi. Other pieces of the captured arms have been transported to a nearby village where they are kept hidden."

Until recent years, Mr. Woodward explains, young men of Oraibi carried spears, halberds, and swords in dances.

Three fine old leather shields, which belonged to Spanish soldiers from the Presidio of Santa Fe, and which were captured in battle by Indians of Acoma, are now on exhibition in Santa Fe. The shields were obtained by collectors from the Indians who owned them. The shields are oval with indentations at top and bottom. Upon the faces of these shields, which are made of two pieces of heavy bull hide laced together, are painted the coat of arms of old Spain in red, yellow, and green.

Science News Letter, November 7, 1931

ENGINEERING

Pollution in New York Harbor to be Cleaned Up

THIRTY MILLION dollars is being spent as the first move to clean up the most polluted harbor in the world. Work has begun on a new sewage disposal plant for New York to cost that amount.

The new plant will treat a flow of 180 million gallons of sewage daily, purifying part of the tremendous stream of waste water which continually empties into the harbor and its branches, it will be revealed in the forthcoming issue of *Civil Engineering*, published by the American Society of Civil Engineers.

Incorporating features of design applied successfully elsewhere, the plant will serve one-fifth of greater New York. It will be located at Wards Island in the East River. Several years will be required to complete it.

Science News Letter, November 7, 1931

ASTRONOMY

Motion of New Asteroid Attracts Much Attention

AN ASTEROID that has just been discovered by Dr. K. Reinmuth, of the Königstuhl Observatory at Heidelberg, has attracted the attention of astronomers because of its unusual motion. With an average of three such discoveries every week, one has to be unusual to attract more than a passing interest. The new body, designated as 1931RA, is moving at a very slow speed through the sky. It would take nearly five days to travel the diameter of the full moon. Astronomers at the Rechen-Institut at Berlin, which keeps track of the asteroids, believe that this slow motion is due either to the fact that the new body is among the most distant, or else that it is moving with almost the same speed as the earth. In either event, the body is very interesting, so astronomers have been asked to observe it further.

Science News Letter, November 7, 1931

OCEANOGRAPHY-METEOROLOGY

Warm Ocean Indicates Dry Winter in California

CALIFORNIA will probably have a drier winter than normal this year. This is indicated by studies just completed by Dr. George F. McEwen and Dr. A. F. Gorton of the Scripps Institution of Oceanography. Observations over a considerable period of years have shown that offshore water temperatures higher than average are followed by winters drier than average, and conversely, lower offshore temperatures indicate wet winters. This year's offshore temperatures have been appreciably above ordinary.

The indication of the water temperatures is reinforced by the position of the 1931-32 season in what is known as the Brückner precipitation cycle. This is a long, gradual swing from wet to dry weather and back again, the total period being from 22 to 33 years. Indications are that this season is the low point of the long precipitation cycle, the two California scientists say.

Scientists are familiar with the seasonal forecasts of Dr. McEwen, which have "hit it right" in a very high proportion of the years for which he has undertaken to offer figures on the indicated seasonal rainfall for typical regions of California.

Science News Letter, November 7, 1931

CHEMISTRY

Predicting Undiscovered Elements

Part Two

"A Classic of Science"

Prediction of Ekasilicon, Now Known as Germanium, and Elements of Series 10 Including Radium and the New 87

THE NATURAL SYSTEM OF ELEMENTS AND ITS USE FOR THE PREDICTION OF PROPERTIES OF THE UNDISCOVERED ELEMENTS. By D. Mendelyev, in *Journal of the Russian Chemical Society*, Vol. 3 St. Petersburg, 1871. Translated for the SCIENCE NEWS LETTER by Taisia Stadnichenko.

Ekasilicon

BUT it seems to me that the most interesting of the undoubtedly absent metals will be that which belongs to group IV of the analogues of carbon, namely, to the third series. It will be the metal directly following silicon, and therefore we will call it Ekasilicon. Ekasilicon must have an atomic weight of about 72, because it is followed in this series by arsenic. In character, Ekasilicon will have properties intermediate between silicon and tin, just as Ekaluminium must have properties intermediate between aluminium and indium. Es (rather easily reduced from EsO_2 and K_2EsF_6) must have a volume of about 13, as the volume of Si is 11 and the volume of Sn is 13. We will get the same results if we refer to the third series and go in the direction of Zn, the volume of which is 9, then to El, Es, then As, the volume of which is 14, and then go to Se=18 and Br=27. In this, as in the following odd series, the volume gradually increases from Cu to Br. Consequently free Es must have a specific weight of about 5.5. Its remaining properties will resemble the properties of Si and As to such an extent as the properties of As itself resemble the properties of P and Se, that is, it will at any rate be a fusible metal capable at high temperatures of volatilizing and oxidizing. It will decompose water vapor with difficulty. It will have almost no action on acids, that is, it will not liberate hydrogen and it will form very unstable salts. Alkalies will react

on it similarly to their action on zinc and arsenic. EsO_2 must have a specific volume close to 22, because that is the volume of the oxide of silicon and of the oxide of tin, and therefore a similar volume will be obtained by reasoning from the properties of other oxides of elements belonging to the third series. Thus the specific weight of the oxide of this metal must be close to 4.7. In regard to the basic properties of this oxide, they must be very slight, for in silica they are almost absent and in the tin oxides they are also slightly developed, and therefore the properties of this oxide must be expected to be closer to those of titanous acid. Undoubtedly it will form a gelatinous hydrate which can be dissolved in alkalies and acids, from which it can be separated easily in various ways, as is noted with titanous acid. However, in comparison with the latter, the oxide of Es will possess more clearly defined acidic properties. Thus if Es accompanies titanium in its compounds we must think that, all other conditions being equal, Es would precipitate from an acid medium before titanous acid, while in an alkaline medium it would come down after titanous acid. By these few indications pointing to it, one can be guided in research for these elements in compounds of titanium and zirconium in which many investigators have already tried to find new elements.

Will be decomposable . . .

Es, like all metals of this group, will form with HF an acid of the composition H_2EsF_6 , which can form salts isomorphic with the salts of hydrofluosilicic acid, but it is most likely that Ekasilicon fluoride itself will not be a gaseous compound, as zirconium fluoride and tin fluoride are not gaseous. Ekasilicon chloride will be decomposable by water, as are silicon chloride and tin chloride, and in this relation it will present properties intermediate between the latter two. It is possible that it

will be a liquid, and will have a partial volume of about 113, because the volume of silicon chloride is 112 (at 0° Pierre) and the volume of tin chloride 115 (at 0° Pierre), hence the specific weight of Ekasilicon chloride will be about 1.9. The ability to deoxidize into lower forms of oxides will be slightly developed in Es and in this relation as in the others it will come nearer to titanium. The boiling temperature of Ekasilicon chloride must be close to 90° . It will undoubtedly form metallo-organic compounds, as they are formed by Si, Sn, Zn and As. It will be "atomologic" with them. In this it will differ from Ti and Zr, in which this property is not developed. EsEt_4 will boil at 160° , and will have a specific gravity of 0.96. We might expect that it will have a hydrogen compound and its properties will be very definite, namely EsH_4 will readily decompose into water and metal, because even arsenic hydride possesses this property similarly to lithium hydride. At any rate, the existence of hydrogen compounds with this metal is more probable than it is for tin, and even for tin we might expect tin hydride, SnH_4 , as a gaseous substance but very unstable. Based on this indication it seems to me more probable to find Es in the compounds of titanium and zirconium, although the purification of the minerals containing these elements, owing to the weak oxides of Ti and Zr, presents considerable experimental difficulty. It seems to me most advisable to search for Es in perovskite (perovskite), i.e., a calcium titanate salt sometimes found in nature. I think this because oxide of titanium possesses very weak acidic properties, nevertheless with lime it forms well crystallized cubic perovskite whose occurrence is probably to some extent due to the fact that part of the titanous acid is replaced by the oxide of Ekasilicon. It may be that the majority of ordinary titanium compounds, especially those that are obtained from TiFeO_3 , eshenite, and similar ones, contain besides titanium an admixture of some similar element with a higher equivalent, because on comparing the equivalent of titanium with the equivalent

lent of the neighboring elements we can see that it is somewhat high. The transition from $\text{Ca}=40$ to $\text{Ti}=50$ is too rapid and from $\text{Ti}=50$ to $\text{V}=51$ is too slow, and if Ti in reality possessed an atomic weight of about 48 the relation of its atomic weight to the weights of the other neighboring elements would be more regular. It may be, again, that the determination of its atomic weight is not correct because titanic compounds can not be prepared in a very pure state because the properties of titanic acid are not distinct. There are only two forms in which titanium can be separated well from admixture, namely, volatile titanium chloride—but of course no substance has yet been obtained in a pure state in the form of a volatile compound—and another form, TiK_2K_6 , but such compounds are also formed by Ekasilicon. At any rate, more accurate experiments on the determination of the atomic weight of titanium are not devoid of great interest.

Full right to judge . . .

The above given indications for the properties of expected elements could not appear to anybody as devoid of a firm foundation, and it would be a considerable addition to the theoretical side of the problem if one of the expected elements should be definitely discovered and its properties should prove such as might be expected through a comparison based on the natural system in which we have placed the elements according to their atomic weights. Besides these certainly probable ones, there is a possibility of other undiscovered elements, even whole groups of others, whose existence is to some extent doubtful because we know nothing of the nature of the forces which produce the so-called elementary forms of matter. We have full right to judge of the elements that are found in the center of the system within the limits in which many of the elements are well known, but we cannot say the same of the elements that must be placed at the ex-

treme parts of the system. It may be that certain equilibria, i.e., the existence of certain "atomologues", are simply impossible, just as certain members of homologous series, under all the conditions necessary for the formation, are not obtained but are transformed into other, more stable polymeric or different forms, as in the case of methylene, for instance. It is possible also that there exist elements with lower atomic weight, between 1 and 7, occurring between hydrogen and lithium, and elements in Group VIII with atomic weights of about 20, i.e., located between fluorine and sodium, like the iron group found between manganese and copper. I would like to draw attention to a striking fact, that in the system of elements at present 17 elements are absent (i.e., a complete two-series period) having atomic weights from 138 to 182. This phenomenon could hardly be accidental, since among the elements with lower atomic weights and also among the elements with higher atomic weights we already know many members. Into this space it is possible to put some of the cerium metals, because if we give to their oxides the composition of R_2O_3 or RO_2 we obtain for them atomic weights from 140 to 180, if the accepted equivalents as determined at present are sufficiently accurate. Among other elements with small atomic weight we might expect one more analogous with manganese than with titanium, belonging to the platinum group having a smaller atomic weight than ruthenium, namely about 100, referred to Group VII and capable of forming a salt KRO_4 similar to potassium permanganate. It may be that the elements analogous with sodium in Group I and possessing atomic weights close to copper and silver exist, although the lighter metals are able to form, like sodium, the compounds RHO , ROI , etc. and therefore it may be that they make the transition from elements of the eighth group to elements of the second. Among the heavy metals, that is, those with large atomic weights, we might expect an element analogous with tellurium and having an atomic weight greater than bismuth. It ought to have distinctly metallic properties, the ability to form an acid similar to sulphuric acid, but an even stronger oxidizing agent than telluric acid. The oxide of this element RO_2 found in VI-9 ought to be a fairly strong base, like the oxide of bismuth—we cannot expect acid properties for the oxide RO_2 in this place. This element ought to form metallo-or-

ganic compounds. Hydride compounds very likely will not exist because with increased atomic weight and increasing basic metallic character of the element, the tendency to combine with hydrogen, as has been noted in the transition from chlorine to bromine and iodine, decreases. Then in the tenth series we might expect basic elements belonging to Groups I, II, and III. They must have atomic weights of about 210-230. The first of them must have the oxide R_2O , the second RO , and the third R_2O_3 . The first will be similar to cesium, the second to barium, and all their oxides will have the character of strong bases, because in this series (10) even thorium in its oxide ThO_2 has distinctly basic properties, and even uranium of the same series in its oxide UO_3 still has a clearly basic character. Between thorium and uranium in this series we must expect another element with basic properties, although slightly developed, with an atomic weight of 235. This element must form an oxide of higher degree of oxidation with the composition R_2O_5 , like columbium and tantalum, with which it ought to be analogous. It is possible that in the minerals containing these elements small amounts of weak acids formed by this metal are found.

Many acid-forming elements . . .

The tenth series ends the elements now known, and as in the series of typical elements we found many acid-forming elements while that phenomenon was not repeated in the following series, so in the tenth series we found many base-forming elements and this also is not repeated in the other series, from this we can conclude that here we are close to the end of the possible forms of elementary compounds. Confirmation of this supposition can be seen in the fact that the atomic weights of the elements in the first series differ between the groups by about 16, but in the following series this difference reaches 25 and even more, while the difference between neighboring elements in the last series is again decreasing.

The use of the principle of periodicity in the search for undiscovered elements and in the determination of their properties, in my opinion, presents the most striking form of the discussion as to the practical application in scientific research of the chemical data derived from the natural system of the elements as based on the sum total of knowledge at hand concerning the already known elements. Without undue exaggeration

Antisepsis

ended the scourge of "hospital gangrene" and reduced the mortality from compound fractures. It was introduced by

LORD LISTER

who describes his methods in the next

CLASSIC OF SCIENCE

of the apparent advantages of such a system, we must finally recognize its correctness, at any rate when the unknown elements predicted on the basis of it, are confirmed by actual discovery. As we must admit, heretofore chemistry did not have any means of foreseeing the existence of new simple bodies and if they were discovered they were found only by means of actual observation. I think that the use of the proposed system of elements for comparison of the elements themselves as well as the compounds which they form presents, even at present, advantages which have not been given by any conception used in chemistry heretofore. But for the final proof of the correctness of the conclusions based on the use of the system, the establishment of certain additional facts is necessary, especially more accurate determination of the atomic weight of certain elements and determination of the physical properties of some of their compounds. When it becomes possible to subject the periodic function of the properties of atomic weight and "atomologic" relationship of the elements to exact laws, then we will approach a closer understanding of the real essence

of the difference between the elements themselves. Then of course chemistry will be able to leave the field of hypothetical conceptions ruling it at present and then it will be possible to give it

dynamic direction already so fruitfully employed in the study of many physical phenomena.

Nov. 29, 1870.

Science News Letter, November 7, 1931

MEDICINE

Cancer Only One of Nobel Prizeman's Research Lines

CANCER, biological physics, and the respiratory function of the tissues are the three chief subjects of research by Prof. Otto Warburg of the Kaiser Wilhelm Institute for Biology, Berlin, who has just been awarded the Nobel Prize in medicine for 1931. Prof. Warburg has made very important contributions in all three of these fields.

Most attention has probably been attracted by his work on cancer.

He showed that cancer cells have quite a different metabolism from ordinary tissue cells. They can get all the energy they need to live and grow and

reproduce from the breaking down of sugar. Unlike other cells, they do not need oxygen but can live without it, much as some disease germs do. This does not mean that cancer is caused by germs, however. It is the suffocation of normal cells by lack of oxygen that gives the cancer cells a considerable advantage in the competition of growth, according to Prof. Warburg's views on the subject.

Prof. Warburg also investigated the photochemistry of plant cells, that mysterious process by which the cells turn carbon dioxide and water into food in the presence of light. He measured very exactly the light absorbed by these green cells and compared it with the amount of carbon dioxide they used. He was then able to show a certain quantum relation between the two. This research of Prof. Warburg's was one of the first pieces of work in which biological physics was compared with the quantum theory.

Other work of Prof. Warburg's was in the field of cell metabolism. He demonstrated the constitution and action of the ferment in the tissue cells which controls the conveyance of the oxygen of the air from the lungs to the muscles and other tissues of the body.

Science News Letter, November 7, 1931

MEDICINE

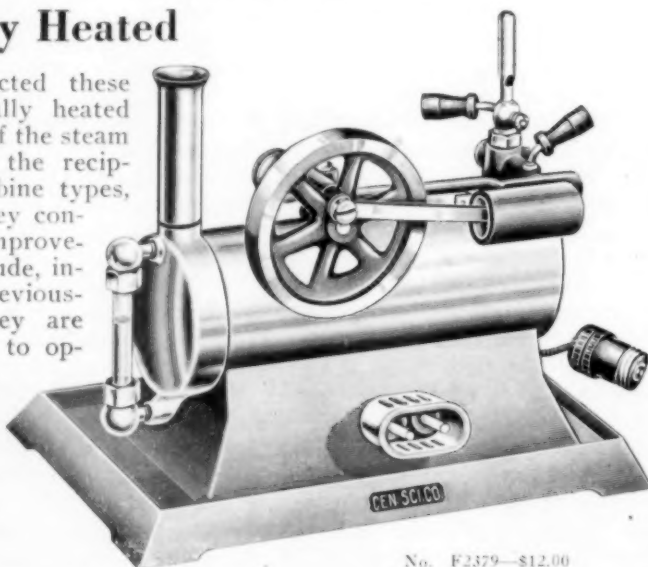
Physiologist Appraises Dr. Warburg's Work

A SCIENTIST'S estimate of the achievements of Dr. Otto Warburg in recognition of which he has been chosen for the Nobel Prize in medicine and physiology for 1931 are contained in a statement made to Science Service by Dr. W. H. Howell, chairman of the Division of Medical Sciences of the National Research Council. Dr. Howell was for many years director of the School of Hygiene

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and Public Health of the Johns Hopkins University, Baltimore. He said:

"The selection of Prof. Otto Warburg for the Nobel Prize in medicine and physiology for 1931 will be cordially approved by American physiologists. He is well known and esteemed in this country for his fine work upon cell metabolism.

"His investigations upon the respiration or mechanism of oxidation in the living cell are of fundamental importance. He has shown that the cell depends upon the iron contained in it to utilize the oxygen that is brought to it by the blood. The iron exists in the cell in a special form, an iron porphyrin compound, which is present in very minute concentration, perhaps one part to a million, but it is very active and functions as a catalyst or ferment which takes up the oxygen and then gives it to oxidizable substances within the cell. In such small amounts its nature could not be detected by ordinary chemical means and Prof. Warburg devised a delicate spectrographic method depending upon the absorption bands given by its compound with carbon monoxide.

"Another significant contribution was his study of the metabolism of the cancer cell as compared with the normal cell. He was able to show that malignant growths have a small respiration but contain relatively large amounts of lactic acid. His work figures largely in all discussions upon the cause of cancer."

Science News Letter, November 7, 1931

PUBLIC HEALTH

Millions Wasted Yearly For School Ventilation

MORE THAN \$2,500,000 is being wasted annually by many cities throughout the country on unnecessary and even hazardous ventilating systems for schools, Dr. C.-E. A. Winslow, professor of public health at Yale University, estimated in a report published by the New York Commission on Ventilation, of which Dr. Winslow is chairman.

Twenty states in the Union still have laws or other regulations concerning ventilating devices which are based on disproved or antiquated theories, the Commission found, although scientific knowledge concerning the proper ventilation of buildings has been in the possession of architects, hygienists and engineers for more than twenty-five years.

For example, these twenty states re-

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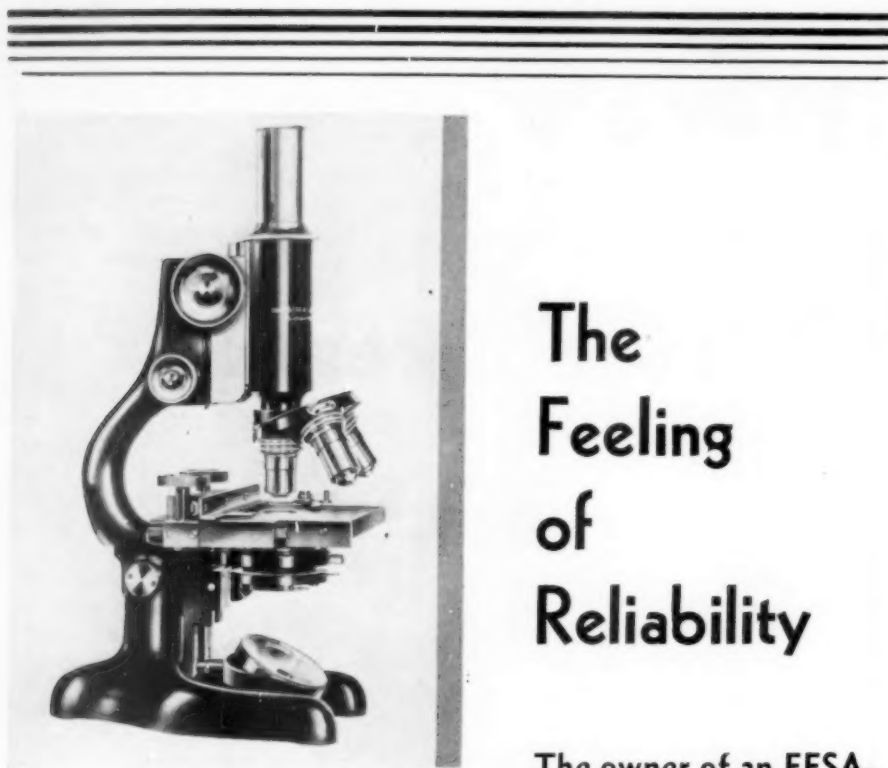
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quire that there be an air supply of thirty cubic feet per minute per person, a condition which can only be obtained by mechanical ventilation involving the use of fans. This system is not only costly but may in some circumstances be a menace to health, the Commission reported, since it tends to produce drafts and overheating.

The evidence gathered during the investigation all showed unmistakably that the window-gravity method of ventilation, in the absence of specific unfavorable conditions, is generally more satisfactory than the fan system because it maintains more uniform temperature, humidity and air movement.

Among other things the Commission recommended maintenance of a room temperature of 65 degrees Fahrenheit in corridors, gymnasiums and shops; of 75 degrees in swimming pools and adjacent dressing rooms; and of 68 degrees in all other occupied rooms.

"The avoidance of overheating is of primary importance for the promotion of comfort and efficiency and the maintenance of resistance against disease," the report stated.

"All classrooms shall have at least fifteen square feet of floor space and two hundred cubic feet of air space per pupil," was another recommendation for a model ventilation law.

Science News Letter, November 7, 1931

PATENTS

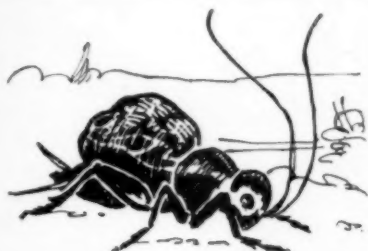
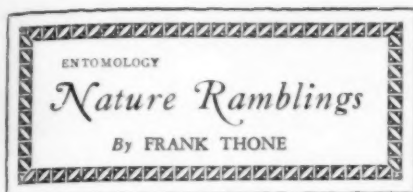
Plant Patents Necessitate Use of Color Printing

THE monotony of the black and white of the U. S. Patent Office files is now to be enlivened by bright colors. Plant patents, recently authorized by act of Congress, will be issued in full color whenever the color is a part of the "invention" claimed by the horticulturist who has produced the new variety of plant.

The two colored patents issued so far are for a white carnation with a delicate touch of yellow, and for a rose of deep pink.

The necessity for putting out patents in color has set a new problem for the Patent Office officials, for color has never previously been required for any type of patent. Despite the great additional expense for printing, the office is not allowed by law to charge any more for copies of the patents, so it is planned to limit the sale of them to those who can show that they have real need for them.

Science News Letter, November 7, 1931



Crickets

FROST has stilled almost all of the great insect chorus that filled the summer air, but the crickets are still with us. They sing more slowly now than they did then, for crickets chirp according to the temperature, faster when they are warm and slower when they are cold. But they are still at it: "Cree-i—i, Cree-i—i". Those that come into our houses become a little livelier after they have the chill thawed out of them.

The tradition of the cricket as the type and symbol of domesticity has been transplanted to this country from Europe. With little reason; for the true house cricket is not found at all abundantly on this continent, except in some parts of Canada. The black field cricket is, to be sure, sometimes found in houses in the United States, but that is not his natural habitat. And any kind of cricket in the house is not a sign of good luck—unless holes gnawed in carpets and upholstery are kinds of good luck.

One species of cricket that few people ever see, but from whose depredations many suffer, especially in the South, is the mole cricket. He is a permanent subterranean dweller, mining about just beneath the surface, like a little insect mole. Mole-like, too, are his curiously flattened forelegs, which he carries up close to his face. The mole cricket is a most unwelcome guest when he appears in numbers in a lawn or pasture for he feeds entirely on the roots of forage plants, and can do immense amounts of mischief.

Science News Letter, November 7, 1931

Centuries ago, a tribe of Mexican Indians is said to have lived for more than fifty years without salt, when hostile Aztecs cut off outside supplies.

PSYCHOLOGY

Farm Student Appears More Radical than City Cousin

CONTRARY to public opinion, the boy from the farm is not more conservative than his city cousin in his views on social problems such as divorce, a single moral standard, capital punishment, and women smoking in public, it would seem from a survey made at Louisiana State University by Dr. Charles Homer Bean. Of the students at that institution, those who came from large cities were the most conservative, and the most radical group had lived both on farms and in small villages.

Men Less "Modern"

High school students, he found, are much more conservative than university students. Men are less "modern" than women. The high school boy is on the average more progressive than his male parent, but is less progressive than is his mother.

A complication which Dr. Bean found in the study of conservative and progressive attitudes in either a group or in an individual is that either may be progres-

sive or even radical in some matters, and conservative or decidedly static in others.

"For example," he says, "the United States of America, which prides itself on being much more up to date, especially in industrial and commercial matters, than her European and Central and South American competitors, familiar, as most of them are not, with a decimal monetary system, has resisted decades of effort on the part of the government and the schools to introduce the now almost universal metric system of weights and measures."

So also he found that 50 per cent. of the men students and 40 per cent. of the women approved of women's smoking in public, but only 33 per cent. of the men and 7 per cent. of the women allowed men to take their coats off in public places.

Science News Letter, November 7, 1931

Foretasting Meteors

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well placed; and they do not appear on the maps. Mercury is an evening star all month, and on the fifteenth is about five degrees above the western horizon at sunset, where it will be difficult to locate, because of the bright sky. At the same time Venus, next planet in order from the sun, will be a little higher, and also difficult to locate. Mars at the middle of the month, will set about an hour after the sun, and may be glimpsed at dusk. Saturn is low in the southwest in the constellation of Sagittarius, the archer, and sets about four hours after the sun. Brightest of all the planets this month, however, is Jupiter, which rises about eleven o'clock.

Science News Letter, November 7, 1931

A department of chiropody has recently been opened in an English hospital, to treat certain types of foot disabilities.



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Psychology

CONDITIONS AND CONSEQUENCES OF HUMAN VARIABILITY—Raymond Dodge—*Yale University Press*, 162 p., \$2.50. To quote the author's preface. "I am primarily an experimentalist with a bias toward exploration. But it probably serves both exploration and experiment occasionally to gather the scattered fragments of one's work into coherent form and to discuss their implications. The consequences in this case are some seemingly important conclusions concerning the significance of variability in mental development and in the integration called consciousness." Such an integration of the researches of a man who has been doing significant work for thirty-five years or more makes a really worthwhile book.

Science News Letter, November 7, 1931

Seismology

LIST OF SEISMOLOGICAL STATIONS OF THE WORLD—Compiled by H. E. McComb and Clarence J. West—*National Research Council*, 119 p., \$1.50. This second edition of the list of seismological stations fills an increasingly felt want, for the first edition has for some time been both out of print and out of date. Stations are listed alphabetically by geographical location; information about each includes exact address, official in charge of station and other personnel, geographical coordinates and other physical data, instruments with their installation dates, supporting institutions and station publications.

Science News Letter, November 7, 1931

Geography

OUR WORLD TODAY—De Forest Stull and Roy W. Hatch—*Allyn and Bacon*, 721 p., \$2. School children who bring this book with them for home work may find themselves forced to fight their elders for its possession. They will certainly be told, "We didn't have geographies like that when *we* were in school!" The authors are to be congratulated on their success in making their science so much alive.

Science News Letter, November 7, 1931

Horticulture

ADVENTURES IN A SUBURBAN GARDEN—Louise Beebe Wilder—*Macmillan*, 250 p., \$3.50. Of the making of gardens there should be no end; and the time to make gardens is now, when the ground is bare and one need be less concerned about pulling or digging

things up. Then everything but the planting will be finished before spring. Wherefore good books on gardening should be read in autumn and winter, and the appearance of this worthy addition to the very extensive Macmillan literature in horticulture is timely.

Science News Letter, November 7, 1931

Astronomy

TEXT-BOOK ON SPHERICAL ASTRONOMY—S. M. Smart—*Macmillan*, 414 p., \$7. Astronomy has had so much attention focused lately on its awe-inspiring features—nebulae millions of light-years away, stars with temperatures Dante never dreamed of—that one almost forgets it is also a very sober, workaday science, that tells sailors where they are and landmen what time it is. Basic to all this is the astronomy of position, and it is for the training of the patient and precise observers who will do this work that the present text has been designed.

Science News Letter, November 7, 1931

Sociology

THE FAMILY—F. Müller-Lyer—*Knopf*, 406 p., \$5. A translation by F. W. Stella Browne from the German "Die Familie" originally published in Munich in 1912. Dr. Müller-Lyer discusses the evolution of the family from prehistoric times.

Science News Letter, November 7, 1931

Chemistry

LABORATORY EXERCISES AND PROBLEMS IN GENERAL CHEMISTRY—B. Smith Hopkins and Harvey A. Neville—*Heath*, 164 p., \$1.76. A concise and complete laboratory manual for the college general chemistry class including an introduction to qualitative analysis and a section on chemical arithmetic.

Science News Letter, November 7, 1931

Child Study

THE INFANT WELFARE MOVEMENT IN THE EIGHTEENTH CENTURY—Ernest Caulfield—*Hoebner*, 203 p., \$2. These were the days when it was commonplace for unwanted babies to be exposed in the streets to die, and when the infant death rate in London was said to be 75 per cent. of the population, but the eighteenth century also marked the beginnings of that interest in child welfare which has taken such enormous strides in recent years. The author gives an interesting description of both the ignorances and the progress of that time.

Science News Letter, November 7, 1931

Geology

THE AGE OF THE EARTH—*National Research Council*, (Bulletin No. 80) 487 p., \$4.50. This is the fourth volume of a series on the physics of the earth, this one being prepared by a committee consisting of Prof. Adolf Knopf, Chairman, Prof. E. W. Brown, Prof. Arthur Holmes, Prof. A. F. Kovarik, Prof. A. C. Lane and Prof. Charles Schuchert. Most of the evidence presented is from radioactivity, though there are short sections on estimates based on sediments, the salinity of the ocean and astronomical data. That two thousand million years have elapsed since the formation of the earth's crust is the outcome of the present study.

Science News Letter, November 7, 1931

Physics

THE COMMUTATOR MOTOR—F. J. Teago—*Dutton*, 80 p., \$1.10. A brief, technical review of the commutator motor with a good bibliography to spur further reading. The text is one of a series of monographs on physical subjects edited by Dr. B. L. Worsnop, King's College, London.

Science News Letter, November 7, 1931

Archaeology

MEDINET HABU REPORTS: I, The Epigraphic Survey 1928-31—Harold H. Nelson; II, The Architectural Survey 1929-30—Uvo Holscher—Univ. of Chicago Press, 69 p., \$1. The second volume of plates of the reliefs and inscriptions at Medinet Habu is now in press. It is the material of this new series which Mr. Nelson describes in this illustrated report on the epigraphic survey's work. The architectural survey reports on its excavations in the Roman and Coptic town layers and also in the old Ramessid stratum. The plan and successive changes in the Small Temple, which have been given special attention, provide an enlightening picture of Egyptian temple building from the eighteenth dynasty to the Coptic period.

Science News Letter, November 7, 1931

Acoustics

BIBLIOGRAPHY OF ACOUSTICS OF BUILDINGS—F. R. Watson—*National Research Council*, 43 p., 50c. This pamphlet, collecting into one place references to a very much scattered literature, will be of great use to engineers and architects.

Science News Letter, November 7, 1931